

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) An alignment device, comprising:
a longitudinal guide portion, having a longitudinal opening including a guide axis;
a spherical portion coupled to an end of the longitudinal guide portion;
a base unit, ~~having~~ including:

a deformable spherical socket for mating with the spherical portion; and
a substantially planar portion wherein the deformable spherical socket
extends from a first side of the substantially planar portion; and

an actuating device surrounding and engaging an outer perimeter of the spherical socket, wherein the actuating device is not in direct contact with the spherical portion; and

a number of standoff features attached to the base unit, wherein the standoff features are adapted to mount directly to a skull of a subject, and adjacent to an opening in the skull, wherein the number of standoff features attached to the base unit extend from a second side of the substantially planar portion to position the substantially planar portion a distance away from the skull.

2. (Original) The alignment device of claim 1, further including at least one relief opening in a portion of the spherical socket, allowing deformation of the spherical socket.

3. (Original) The alignment device of claim 1, wherein the actuating device is adapted to cause substantially symmetric tightening of the spherical socket around at least a part of the spherical portion.

4. (Canceled)

5. (Original) The alignment device of claim 1, wherein the actuating device includes a threaded locking ring adapted to engage a number of threads coupled to the spherical socket.

6. (Previously Presented) The alignment device of claim 1, wherein the at least one relief opening includes three relief openings substantially equally spaced about a circumference of the spherical socket.

7. (Canceled)

8. (Withdrawn) The alignment device of claim 1, wherein at least one standoff feature is adapted to contact the work surface along a line.

9. (Previously Presented) The alignment device of claim 1, wherein at least one standoff feature is adapted to contact the work surface along a circle.

10. (Withdrawn) The alignment device of claim 1, further including an orienting fixture attached to the longitudinal guide portion, wherein the orienting fixture is detectable using tissue imaging techniques.

11. (Currently Amended) An alignment device, comprising:

- a longitudinal guide portion, having a longitudinal opening including a guide axis;
- a spherical portion coupled to an end of the longitudinal guide portion;
- a base unit, having a spherical socket for mating with the spherical portion and a substantially planar portion wherein the spherical socket extends from a first side of the substantially planar portion;
- a number of securing devices adapted to secure the base unit to a skull;
- at least one relief opening in a portion of the spherical socket defined by a complete disassociation of at least two portions of the spherical socket, allowing deformation of the spherical socket;
- an actuating device coupled to the spherical socket, adapted to cause substantially symmetric tightening of the spherical socket around at least a part of the spherical portion; and
- a number of standoff ~~features~~ members attached to the base unit;
- wherein the standoff members attached to the base unit extend from a second side of the substantially planar portion such that the standoff members extend in a direction substantially opposite to the spherical socket;
- wherein the number of standoff features are adapted for placement adjacent to an opening in a skull of a subject, and
- wherein ~~a substantial portion~~ the substantially planar portion of the base unit and the spherical socket is adapted to mount ~~above~~ a distance away from the skull where the standoff members contact the skull.

12. (Original) The alignment device of claim 11, wherein the number of standoff features attached to the base unit includes three standoff features.

13. (Canceled)

14. (Original) The alignment device of claim 11, wherein the number of standoff features attached to the base unit includes a truncated cone shaped standoff feature.

15. (Original) The alignment device of claim 11, wherein the actuating device includes a threaded locking ring adapted to engage a number of threads coupled to the spherical socket.

16. (Original) The alignment device of claim 11, wherein at least one relief opening includes three relief openings substantially equally spaced about a circumference of the spherical socket.

17. (Currently Amended) An alignment device, comprising:

a longitudinal guide portion, having a longitudinal opening including a guide axis;

a spherical portion coupled to an end of the longitudinal guide portion;

a base unit operable to be positioned relative to a work surface, having a deformable spherical socket for mating with the spherical portion; and

an actuating device operatively connected to the spherical socket, wherein the actuating device is not in direct contact with the spherical portion;

at least one standoff feature having a standoff feature thickness attached to the base unit, wherein a substantial portion of the base unit is adapted to mount above the work surface, wherein the at least one standoff feature includes a shelf that extends into a bore defined by the at least one standoff feature to determine an attachment thickness in combination with an attaching device wherein the attachment thickness is less than the standoff feature thickness, wherein the at least one standoff feature defines a passage through which the attaching device is operable to pass substantially freely; and

a retention force providing member coupled to the base unit and operable to retain the attaching device near the passage.

18. (Canceled)

19. (Previously Presented) The alignment device of claim 17, wherein the retention force providing member includes a structure that protrudes into a portion of the passage.

20. (Previously Presented) The alignment device of claim 17, wherein the retention force providing member is located external to, and above the passage.

21. (Canceled)

22. (Currently Amended) An alignment device, comprising:

- a longitudinal guide portion, having a longitudinal opening including a guide axis;
- an insert located substantially within the longitudinal opening wherein an outer diameter of the insert fits closely with the longitudinal opening, and an inner diameter is sized to fit closely with a device to be guided;
- a spherical portion coupled to an end of the longitudinal guide portion;
- a base unit, having a spherical socket for mating with the spherical portion;
- at least one bone screw adapted to secure the base unit to a skull;
- at least one relief opening in a portion of the spherical socket, allowing deformation of the socket;
- an actuating device coupled to the spherical socket, adapted to cause substantially symmetric tightening of the spherical socket around at least a part of the spherical portion; and
- a number of standoff features attached to the base unit, for placement adjacent to an opening in the skull, wherein a substantial portion of the base unit is adapted to mount above the skull, wherein at least one standoff feature includes a shelf defined within a perimeter of the standoff features to determine an attachment thickness in combination with the bone screw wherein the attachment thickness is less than a standoff feature thickness.

23. (Original) The alignment device of claim 22, wherein the insert includes an inner diameter that is sized to fit closely with a biopsy probe.

24. (Canceled)

25. (Original) The alignment device of claim 22, wherein at least one standoff feature is adapted to contact the work surface along a circle.

26. – 34. (Canceled)

35. (Previously Presented) The alignment device of claim 1, wherein at least one standoff feature includes a shelf to determine an attachment thickness in combination with the bone screw wherein the attachment thickness is less than a standoff feature thickness.

36. (Previously Presented) The alignment device of claim 1, wherein the spherical socket defines less than an entire sphere.

37. (Previously Presented) The alignment device of claim 1, wherein the actuating device engages an entire perimeter of the spherical socket.

38. (Currently Amended) The alignment device of claim 2, wherein the at least one relief opening includes at least three relief openings, wherein the relief openings are defined as a complete passage between at least two members defining at least a portion of the spherical socket of the base.

39. (Previously Presented) The alignment device of claim 11, wherein the securing devices pass through at least a portion of the standoff features.

40. (Currently Amended) The alignment device of claim 11, ~~wherein the base unit further includes a substantially planar portion wherein the spherical socket extends from a first side of the substantially planar portion and the number of standoff features attached to the base unit extend from a second side of the substantially planar portion;~~

wherein the spherical socket includes at least two members ~~hingedly~~ deformably connected to the first side of the substantially planar portion;

wherein the relief opening includes the complete disassociation of the at least two members from each other above the substantially planar portion.

41. (Previously Presented) The alignment device of claim 18, wherein the base defines a groove at a perimeter of the base operable to hold the elastomer band near the passage.

42. (Previously Presented) The alignment device of claim 22, wherein the base unit further includes a substantially planar portion wherein the spherical socket extends from a first side of the substantially planar portion and the number of standoff features attached to the base unit extend from a second side of the substantially planar portion;

wherein the number of standoff features each define a through bore operable to allow the at least one bone screw to pass through at least one of the number of standoff features to engage the skull;

wherein the actuating device surrounds the entire spherical socket to substantially symmetric tighten the spherical socket around at least a part of the spherical portion.

43. (Currently Amended) An alignment device, comprising:

- a longitudinal guide portion, having a longitudinal opening including a guide axis;
- a spherical portion operably coupled to an end of the longitudinal guide portion;
- a base unit, including:
 - a first portion defining an outer perimeter;
 - a deformable spherical socket including at least two fingers extending separately from the first portion for mating with the spherical portion, wherein a relief opening is defined as a complete separation between the at least two fingers extending from an outer perimeter to an inner surface and the at least two fingers are operable to hinge deform relative to the first portion independently of one another;
 - an actuating device that surrounds and engages the entire outer perimeter of the spherical socket and operable to substantially symmetrically compress the at least two fingers of the spherical socket, wherein the actuating device is not in direct contact with the spherical portion;
 - a standoff feature attached to the base unit, wherein the standoff feature is adapted to directly engage a work surface near an opening in the work surface;
 - a passage defined through the standoff feature;
 - an attaching device operable to pass through the passage and engage the work surface; and

a retaining force applying member operable to hold the attaching device relative to the passage at least prior to moving the attaching device relative to the work surface.

44. (Previously Presented) The alignment device of claim 43, wherein the work surface is a skull of a subject.

45. (Previously Presented) The alignment device of claim 43, wherein the outer perimeter of the spherical socket includes an external thread and the actuating device defines an internal thread operable to engage the external thread;

wherein the actuating member is operable to move relative to the spherical socket, via interaction with the internal thread;

wherein as the actuating member moves relative to the spherical socket the at least two fingers move toward the guide axis.

46. (Currently Amended) The alignment device of claim 43, wherein the retaining force applying member includes ~~at least one of an elastomer band, a first structure that protrudes into a portion of the passage, a second structure that is located external to and above the passage, or combinations thereof.~~ extending across the passage and is fit within a groove defined by an external perimeter of the base unit.

47. (Currently Amended) The alignment device of claim 43, wherein the at least one standoff feature includes a shelf extending into the at least one standoff feature to determine an attachment thickness in combination with the attaching device wherein the attachment thickness is less than a standoff feature thickness.

48. (New) The alignment device of claim 1, further including:
a shelf that extends into a bore defined by each of the number of standoff features;
wherein each of the number of standoff features extend from a first standoff feature end at the substantially planar portion to a second standoff feature end;
wherein the shelf defines a surface intermediate the first standoff feature end and the second standoff feature end.

49. (New) The alignment device of claim 11, further including:
a shelf that extends into a bore defined by each of the number of standoff features;
wherein each of the number of standoff features extend from a first standoff feature end at the substantially planar portion to a second standoff feature end;
wherein the shelf defines a surface intermediate the first standoff feature end and the second standoff feature end;
wherein a portion of the substantially planar portion extends into the bore at the first standoff feature end.

50. (New) The alignment device of claim 17, further including:

wherein the at least one standoff feature extends from a first standoff feature end to a second standoff feature end;

wherein the shelf defines a surface intermediate the first standoff feature end and the second standoff feature end;

wherein the attaching device engages the shelf to attach the base unit to the work surface.

51. (New) The alignment device of claim 22, further including:

a passage defined by each of the number of standoff features;

wherein each of the number of standoff features extends from a first standoff feature end to a second standoff feature end;

wherein the shelf defines a surface intermediate the first standoff feature end and the second standoff feature end in the passage;

wherein the bone screw engages the shelf to attach the base unit to the work surface.

52. (New) The alignment device of claim 43, further including:
a shelf;
a passage defined by the standoff feature;
wherein the standoff feature extends from a first standoff feature end to a second standoff feature end;
wherein the shelf defines a surface intermediate the first standoff feature end and the second standoff feature end in the passage;
wherein the attaching device engages the shelf to attach the base unit to the work surface.

53. (New) The alignment device of claim 43, wherein the standoff feature extends from the base unit a distance to position the base unit at least a portion of the distance from the work surface.

54. (New) The alignment device of claim 14, where at least one of the securing devices extends a length of the truncated cone to engage the skull.

55. (New) An alignment device, comprising:

- a longitudinal guide portion, having a longitudinal opening including a guide axis;
- a spherical portion coupled to an end of the longitudinal guide portion;
- a base unit operable to be positioned relative to a work surface, having a deformable spherical socket for mating with the spherical portion; and
- an actuating device operatively connected to the spherical socket, wherein the actuating device is not in direct contact with the spherical portion;
- at least one standoff feature having a standoff feature thickness attached to the base unit, wherein a substantial portion of the base unit is adapted to mount above the work surface, wherein the at least one standoff feature includes a shelf to determine an attachment thickness in combination with an attaching device, wherein the attachment thickness is less than the standoff feature thickness, wherein the at least one standoff feature defines a passage through which the attaching device is operable to pass substantially freely; and
- an elastomer band coupled to the base unit and operable to retain the attaching device near the passage.

56. (New) The alignment device of claim 55, further comprising:

- a groove defined in an external perimeter of the base unit;
- wherein the elastomer band is positioned within the groove and extends across the passage to engage the attaching device.

57. (New) The alignment device claim 43, wherein the retaining force applying member includes a first structure that protrudes from a sidewall that defines the passage into the passage.